A Case-Cohort Study of an Early Biomarker of Lung Cancer in a Screening Cohort of Yunnan Tin Miners in China

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Journal: Cancer Epidemiology, Biomarkers & Prevention 1997;6: 893-900

Abstract: We initiated the present study to evaluate the accuracy of a new epithelial biomarker of early lung cancer. We tested the hypothesis that expression of a tumor-associated antigen by exfoliated sputum epithelial cells has greater accuracy (sensitivity and specificity) for the detection of preclinical, localized lung cancer than do routine clinical detection methods. Monoclonal antihody (MAb) 703D4 recognizes heterogeneous nuclear ribonuclear protein (hnRNP) A2/B1. We compared the accuracy of hnRNP up-regulation with cytology and radiographic screening for lung cancer detection in miners who were highly exposed to tobacco smoke, radon, and arsenic in southwestern China. The results showed that MAb 703D4 detection of hnRNP expression by sputum epithelial cells had greater accuracy for the detection of lung cancer than did routine screening methods, particularly for early (localized) disease. Among 57 cases and 76 noncases at the first screening, overall MAb detection of hnRNP was more sensitive (74 *versus* 21% for cytology and 42% for chest x-ray) but had lower specificity (70 *venus* 100% for cytology and 90% for chest x-ray) than standard methods. Recognizing hnRNP up-regulation resulted in detection of approximately one-third more early cases than did the combination of X-ray and cytology. Detection of hnRNP A2/B1 expression appears to be a good initial screening test for lung carcinogenesis, as it identified 74% of those who developed subsequent clinical lung cancer. Future studies might separate individuals with high lung cancer risk by MAb detection, confirming the positives with markers having greater specificiy *(e.g.*, clinical studies that become positive later in the morphological progression).